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PATENT & TRADEMARK OFFICE

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Kousuke SUZUKI

Group Art Unit: 2851

Application No.: 10/713,269

Examiner: P. KIM

Filed: November 17, 2003

Docket No.: 108946.01

For: IMAGE FORMATION CHARACTERISTICS ADJUSTMENT METHOD FOR PROJECTION OPTICAL SYSTEM

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the Office Action dated February 24, 2006, Applicant requests reconsideration of this application. Claims 1-15, 18, 20-27, 29-36 and 39 are pending.

Applicant notes with appreciation the allowance of claims 1-15, 18, 20, 23-27, 29, 32, 33, 35, 36 and 39. Applicant respectfully submits that claims 21, 22, 30, 31 and 34 also are in condition for allowance, as detailed below.

Claims 21, 22, 30, 31 and 34 stand rejected under 35 U.S.C. §112, second paragraph. In particular, the Office Action rejects independent claims 21 and 30, and states that "the limitation that the wavelength of the illumination light is changed according to the amount of change of the installation environment at each exposure shot is unclear. Why would the installation environment change at each exposure shot? Is the apparatus installed at a new environment every time one exposure is completed?" This rejection is respectfully traversed.

As compared with a change in the environment (such as, for example, barometric pressure and temperature) that may occur between a location where a projection optical system is assembled (the assembly location) and a location where the projection optical system is installed and used for exposure (the installation location), a change in the installation environment (for example, barometric pressure and/or temperature) that may occur during exposure at the installation location of the projection optical system is small. Strictly speaking, however, the installation environment at the installation location may change slightly while exposure is being performed, that is, within a period during which exposure for all of the shot areas on one wafer is conducted, and such slight change should not be neglected as explained below.

For a projection optical system, of which image formation characteristics should always be maintained in a predetermined state, it is particularly important to compensate for slight changes in the installation environment at the installation location of the projection optical system. This is because there is a possibility that, due to fluctuation in the image formation characteristics caused by even a slight change in the installation environment, the resolution of the image to be projected onto the substrate (e.g., wafer) deteriorates, or an alignment error is generated. See, for example, the paragraph spanning pages 2 and 3 of Applicant's specification.

The combinations of features recited in independent claims 21 and 30 of the present application deal with the situation discussed above. In particular, independent claim 21 recites the feature of "changing a wavelength of the illumination light according to the change amount of the installation environment at each exposure shot" and independent claim 30 recites the feature that "the wavelength adjusting device changes the wavelength of the illumination light according to the change amount of the installation environment at each exposure shot." As such, the combinations of features recited in independent claims 21 and

30, as well as their dependent claims, cope with any changes (even slight changes) of the installation environment at the installation location.

Applicant respectfully submits that independent claims 21 and 30, as well as their dependent claims, are clear. Applicant has described above why the installation environment can change at each exposure shot as a single substrate is being exposed. The apparatus is not installed at a new location every time one exposure shot is completed, but rather, the installation environment (the environment at the installation location) changes during exposure. Withdrawal of the rejection is requested.

Claims 30 and 31 stand rejected under 35 U.S.C. §102(a) over U.S. Patent No. 5,838,426 to Shinonaga et al. In addition, claims 21, 22 and 34 stand rejected under 35 U.S.C. §103(a) over Shinonaga et al. These rejections are respectfully traversed.

At the bottom of page 2 of the Office Action, the Office Action states "[t]he rejections from the previous office action are maintained due to the issues discussed above [in the rejection under 35 U.S.C. §112, second paragraph]." Because Applicant has addressed the issues raised in the 35 U.S.C. §112, second paragraph rejection, Applicant respectfully submits that the rejections of claims 21, 22, 30, 31 and 34 under 35 U.S.C. §102(a) and §103(a) based on Shinonaga et al. have been overcome.

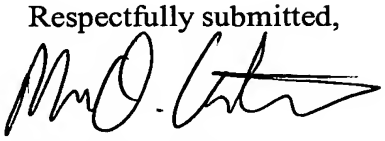
In the paragraph spanning pages 5 and 6 of the Office Action, the Office Action acknowledges that Shinonaga et al. only teaches changing the exposure wavelength based upon changes in the installation environment "every time wafers to be processed are loaded," and does not explicitly disclose making changes "at each exposure shot." As described, for example, in the background portion of Applicant's specification, Applicant teaches that it is important to compensate for changes that occur in the installation environment during an exposure process, not only when wafers to be processed are loaded. Shinonaga et al. does not recognize the need to change the wavelength at each exposure shot according to changes in

the installation environment. Thus, Shinonaga et al. does not disclose or suggest the combinations of features recited in independent claims 21 and 30. Accordingly, Applicant respectfully submits that claims 21, 22, 30, 31 and 34 are patentable over Shinonaga et al.. Withdrawal of the rejections is requested.

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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MAC/ccs

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